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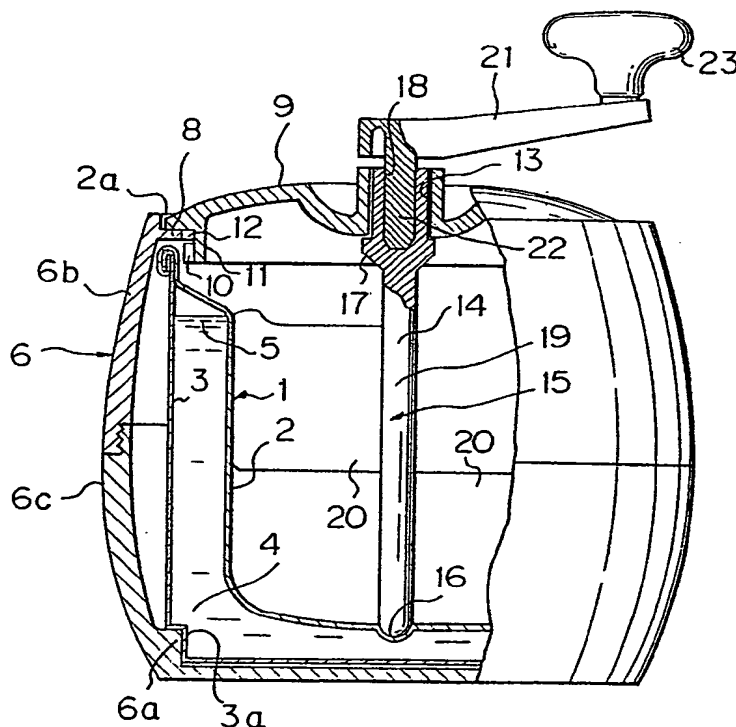
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F4H  
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(54) **Device for preparing frozen confections**

(57) A device for preparing frozen confections comprises a sealed double-walled vessel (1) to receive the ingredients for the frozen confection and having a space (4) between the double walls thereof filled with cold-keeping agent, an outer receptacle (6) receiving therein the double-walled vessel (1), and a cover (9) having a rotatable agitator (15) detachably mounted therein. The device is provided with rotation preventing means for positively preventing the relative rotation between the outer receptacle (6) and the double-walled vessel (1) during the operation of the agitator. The rotation preventing means may be in the form of concave-convex engaging means (3a, 6a) provided between the outer receptacle and the double-walled vessel, or may be in the form of at least one compressible friction material arranged between the outer receptacle (Figures 7-13).

*Fig. 1*



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Fig. 1

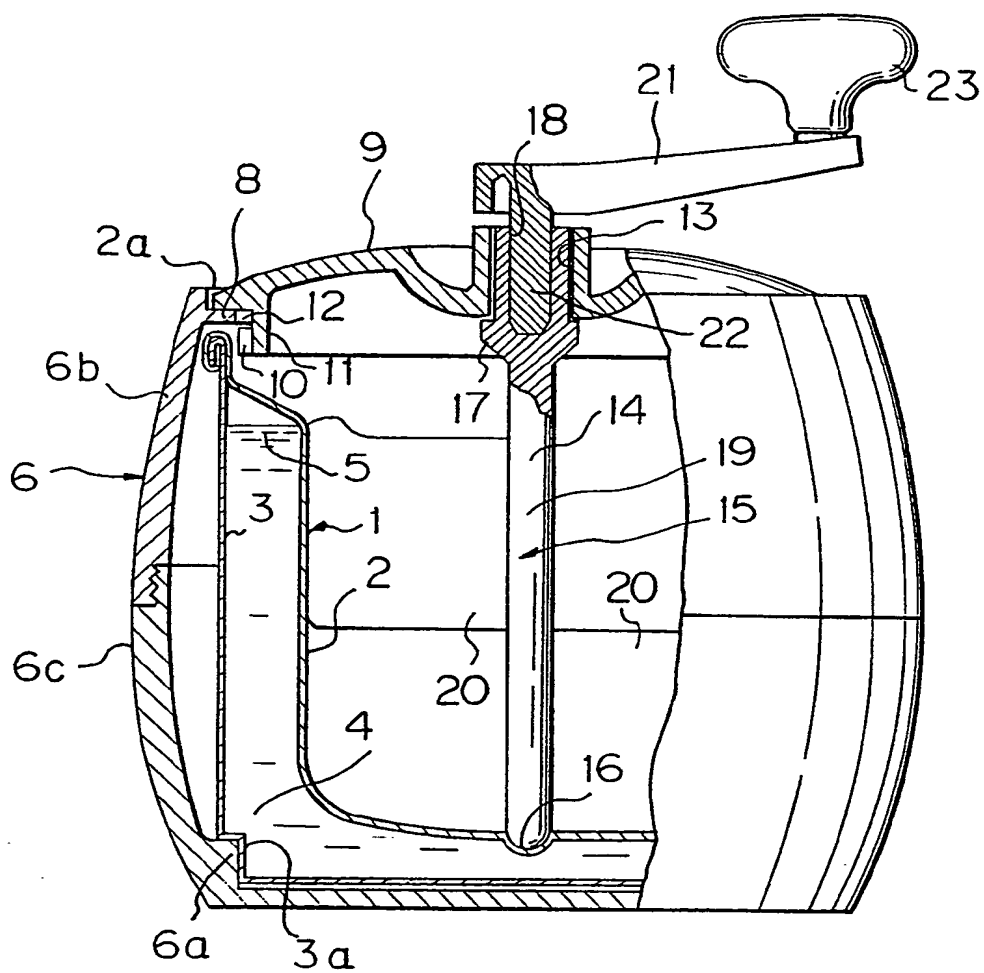


Fig. 2

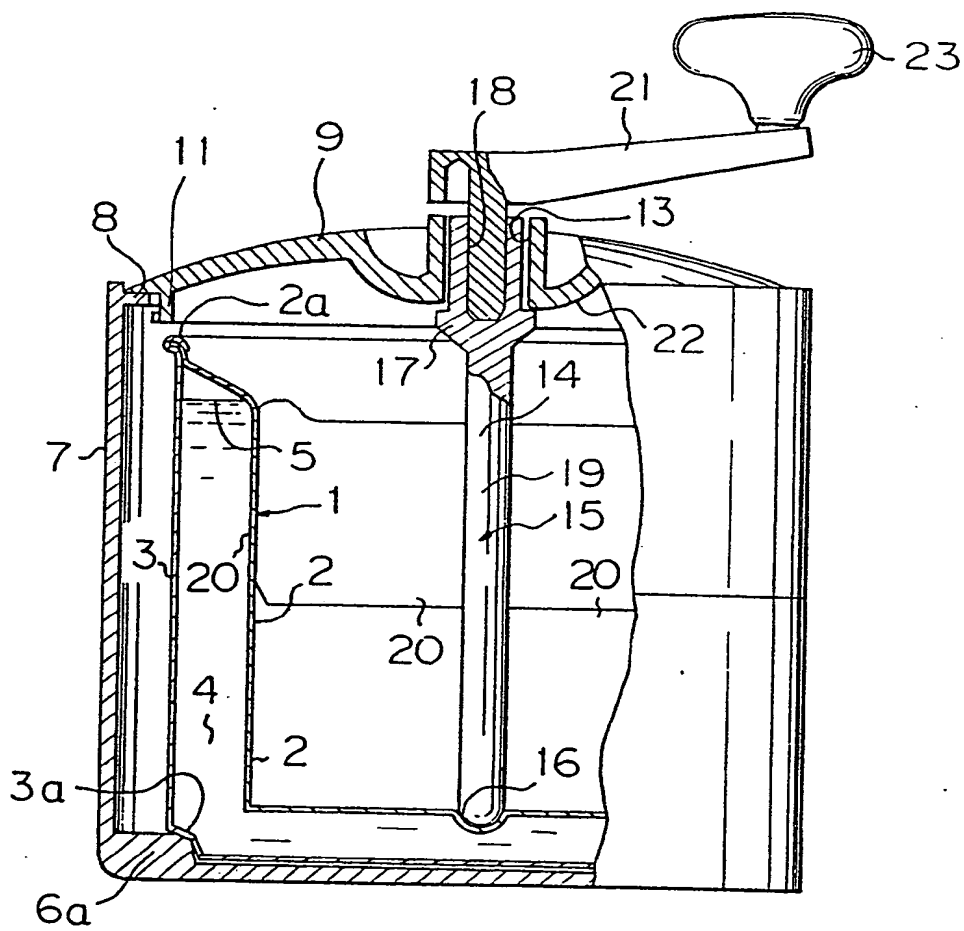


Fig. 3

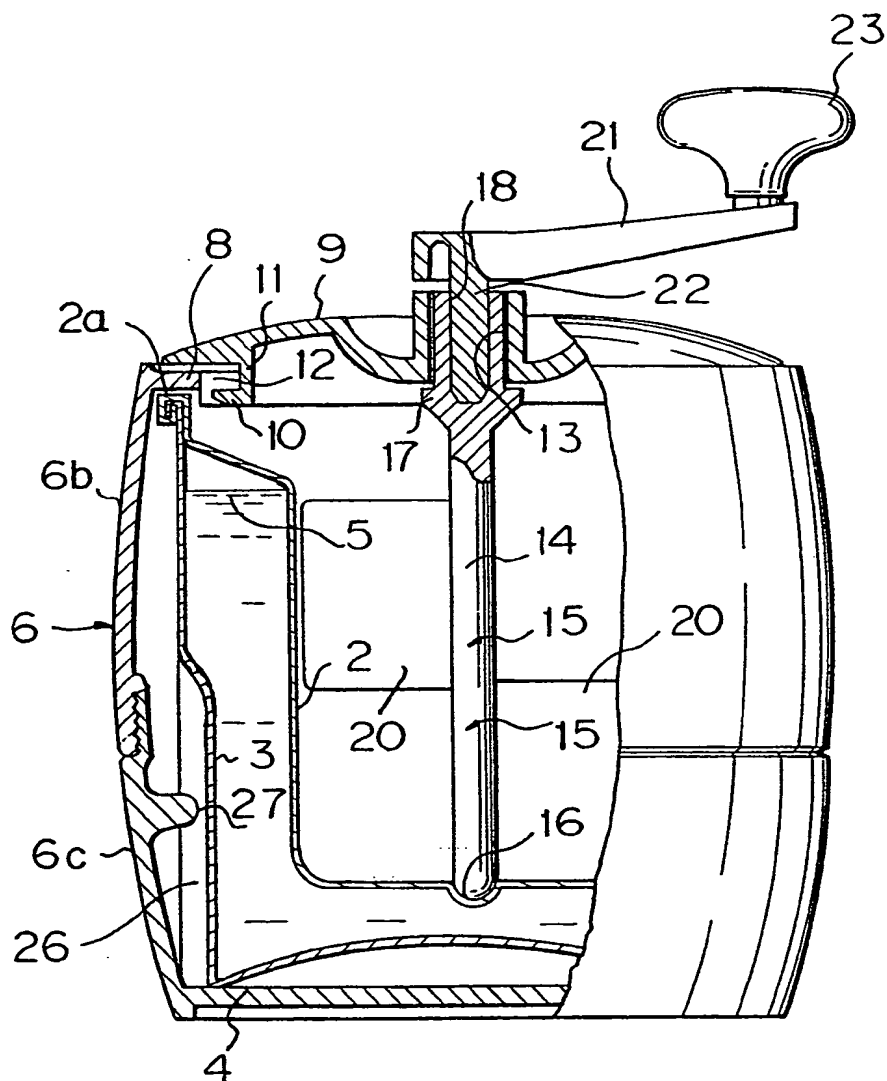


Fig. 4

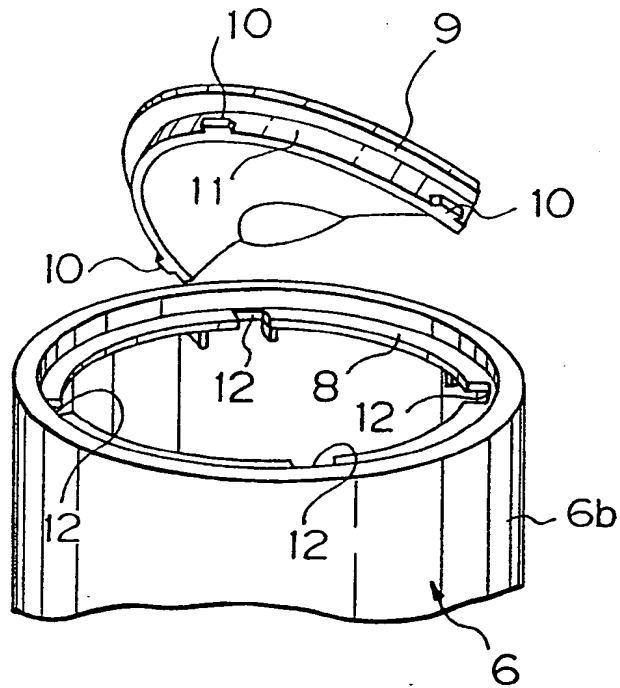
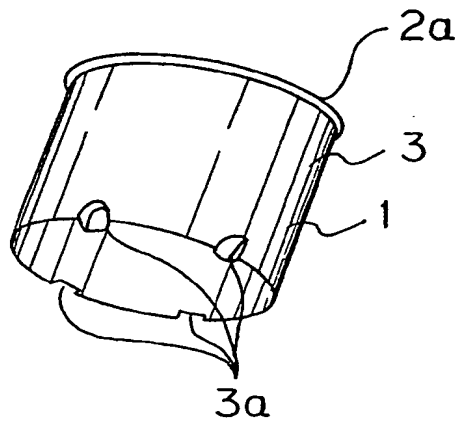


Fig. 5



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Fig. 6

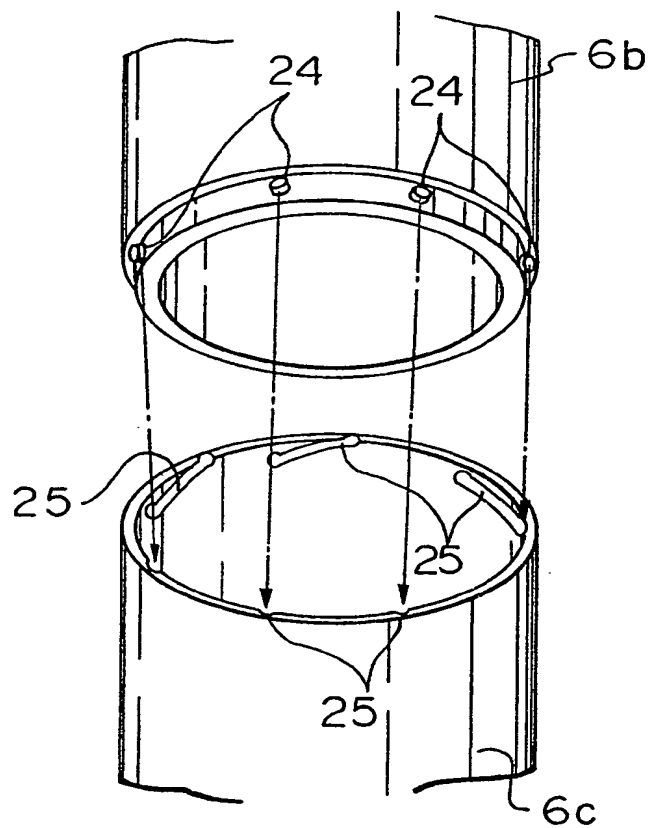
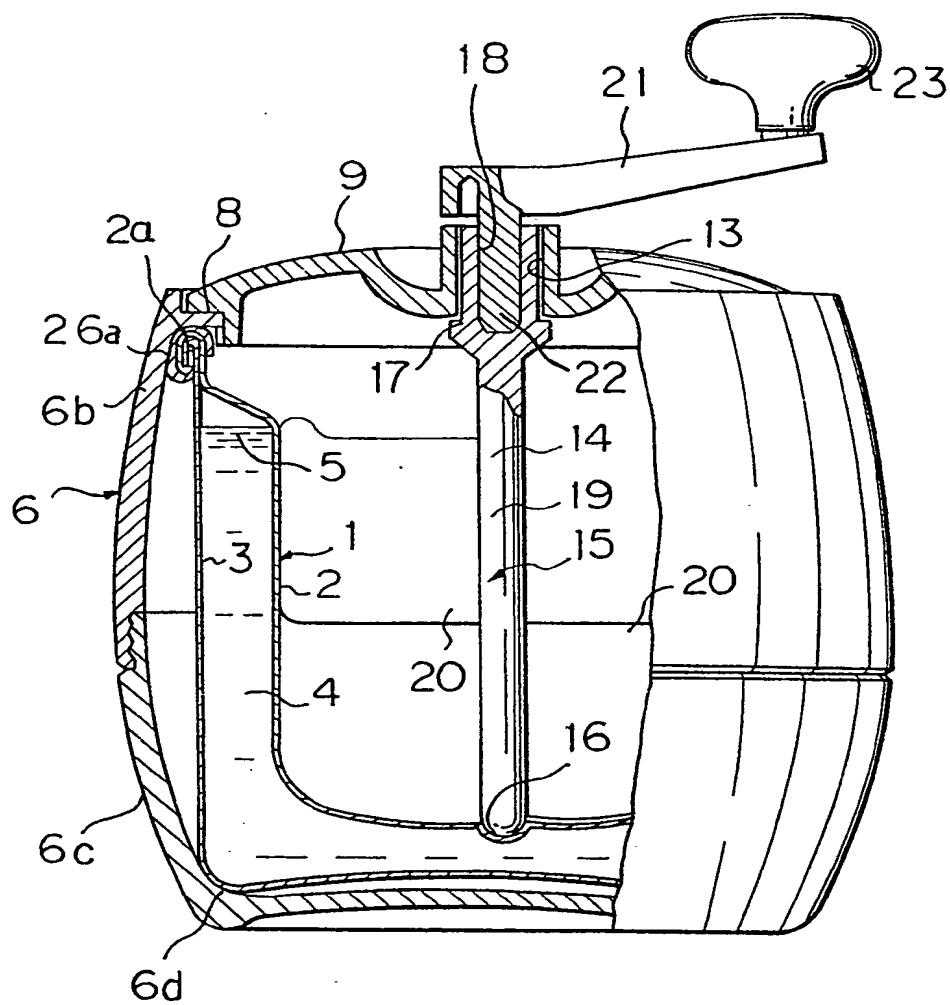
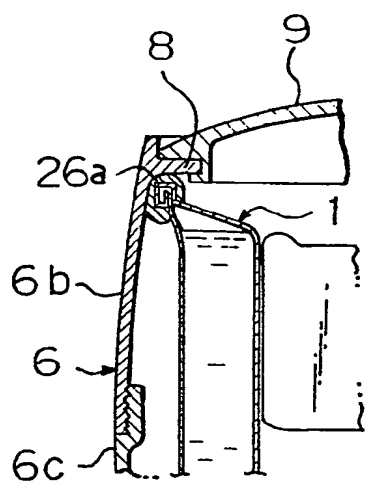
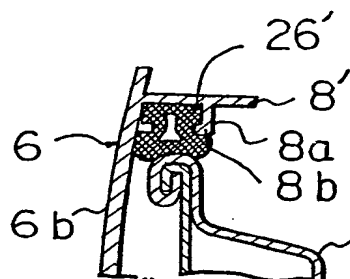
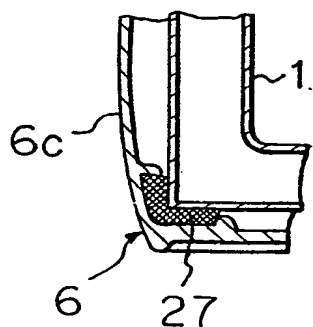
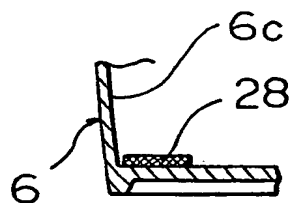
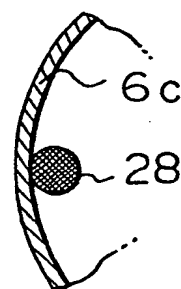
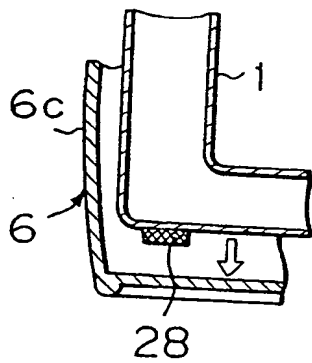


Fig. 7

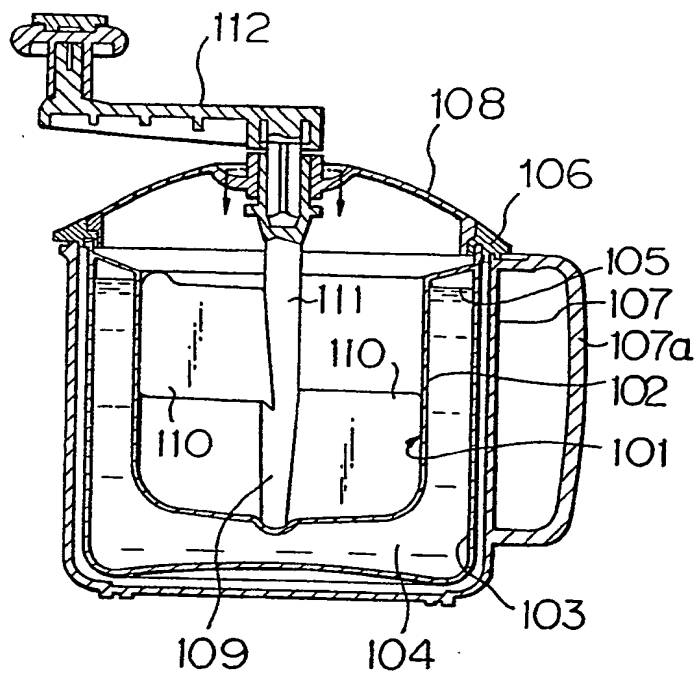


*Fig. 8**Fig. 9**Fig. 10**Fig. 11**Fig. 12*

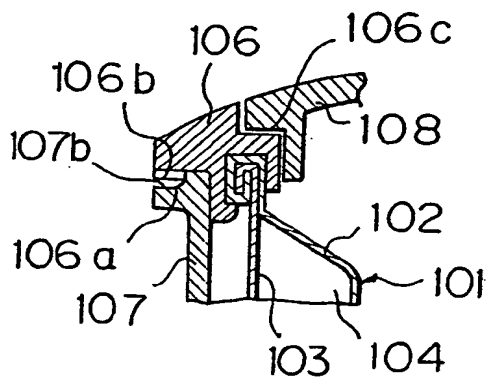


*Fig. 13**Fig. 14*

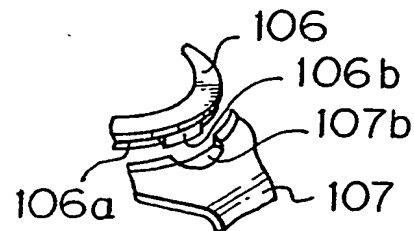
PRIOR ART

*Fig. 15*

PRIOR ART

*Fig. 16*

PRIOR ART



## SPECIFICATION

## Device for preparing frozen confections

- 5 The present invention relates to a device for preparing frozen confections.
- Heretofore, devices for preparing frozen confections have been proposed as disclosed in British Patent Appln. No. 2144208A. One such device
- 10 disclosed in the above patent specification comprises, as shown in Figures 14 to 16 of the accompanying drawings, a double-walled vessel 101 comprised of a cylindrical inner vessel 102 having a closed bottom and a cylindrical outer vessel 103
- 15 enclosing the inner vessel with the upper edges of the inner and outer vessels 102, 103 being hermetically sealed to one another to form a space 104 between the inner and outer vessels 102, 103 in which a cold-keeping agent 105 is sealingly
- 20 enclosed, and a ring 106 made of a pliable material, such as rubber, is frictionally engaged onto the hermetically sealed upper edge of the double-walled vessel 101. The double-walled vessel 101 is received in a cylindrical outer receptacle 107 having a closed
- 25 bottom and made of a material such as a synthetic resin, and provided with a handle 107a. The upper edge of the outer receptacle 107 is formed with a supporting shoulder 106a for supporting the ring 106 attached to the double-walled vessel 101. A
- 30 rotation-preventing recess 107b is formed in a portion of the upper edge of the outer receptacle 107 in which a rotation-preventing projection 106b formed in a portion of the ring 106 is fitted so as to prevent rotation of the ring 106 and hence of the
- 35 double-walled vessel 101 relative to the outer vessel 107. A cover 108 is detachably mounted on a cover-receiving portion 106c formed in the upper surface of the ring 106. An agitator 109 having
- 40 the agitator 109 is rotatably supported at the centre of the cover 108. A handle 112 is detachably mounted on the rotary shaft 111 outside the cover 108 for manually rotating the agitator 109.
- In use, the double-walled vessel 101 is pre-cooled
- 45 in a refrigerator for several hours to freeze the cold-keeping agent 105 in the space 104 and the thus cooled double-walled vessel 101 is then placed in the outer receptacle 107 and an appropriate amount of ingredient from which the frozen confection is to be
- 50 prepared is introduced into the double-walled vessel 101. The cover 108 is then mounted on the ring 106 with the agitating blades 110 dipping into the ingredient in the double-walled vessel 101. By rotating the handle 112, the agitating blades 110
- 55 scrape off the frozen material sticking to the inner wall of the inner vessel 102 while the material is agitated by the agitating blades 110 until frozen confection, such as ice cream or sherbet, is completed.
- 60 In such a device of the prior art, the frictional resistance of the ring 106 prevents the double-walled vessel 101 from being rotated when the handle 112 is rotated. However, since the frictional resistance between the frozen material sticking to the inner wall
- 65 of the inner vessel 102 and the agitating blades 110 is

rather great and the frictional resistance increases as the preparation of the frozen confection proceeds, slippage of the double-walled vessel 101 relative to the ring 106 tends to occur, thereby making it

70 impossible to scrape off the frozen material sticking to the inner wall of the inner vessel 102 so that preparation of the frozen confection becomes impossible to complete.

It is an object of the present invention to provide a

75 device for preparing frozen confections which avoids the above described disadvantages of the prior art device for preparing frozen confections.

In accordance with the present invention, a device for preparing frozen confections comprises a

80 double-walled vessel comprised of a substantially cylindrical inner vessel having a closed bottom and a substantially cylindrical outer vessel having a closed bottom and enclosing the inner vessel with the upper

85 edges of the inner and outer vessels being hermetically sealed to one another and with a space being formed between the inner vessel and the outer vessel, and a cold keeping agent sealingly enclosed in said space, a substantially cylindrical outer

90 receptacle having a closed bottom and adapted to receive the double-walled vessel therein, a cover detachably mounted on the upper edge of the double-walled vessel, and an agitator having a rotary

95 shaft passing through the centre of the cover so as to extend from the exterior of the cover into the interior of the inner vessel with agitating blades being

100 mounted on the rotary shaft in the interior of the inner vessel, means, such as a handle, being attached to the rotary shaft at the exterior of the cover for rotating the agitator, concave-convex

105 engaging means being provided between the inner surface of the outer receptacle and the outer surface of the double-walled vessel for preventing relative displacement in the peripheral direction relative

110 displacement in the peripheral direction between the outer receptacle and the double-walled vessel, thereby permitting the latter to be securely fixed to the former so that the idle rotation or skidding of the double-walled vessel caused by the operation of the agitator is positively prevented during use of the

115 device to facilitate the preparation of frozen confections.

In accordance with another feature of the present invention, a device for preparing frozen confections comprises a double-walled vessel comprised of a

115 substantially cylindrical inner vessel having a closed bottom and a substantially cylindrical outer vessel having a closed bottom and enclosing the inner vessel, with the upper edges of the inner and outer

120 vessels being hermetically sealed to one another with a space being formed between the inner vessel and the outer vessel and a cold-keeping agent sealingly enclosed in said space, a substantially cylindrical outer receptacle having a closed bottom and adapted to receive the double-walled vessel

125 therein, a cover detachably mounted on the upper edge of the double-walled vessel, and an agitator having a rotary shaft passing through the centre of the cover so as to extend from the exterior of the cover into the interior of the inner vessel with

130 agitating blades being mounted on the rotary shaft in

the interior of the inner vessel, means, such as a handle, being attached to the rotary shaft at the exterior of the cover, the outer receptacle being composed of an upper body half and a lower body half separably connected to each other by connecting means, and friction material being interposed between an inwardly extending shoulder portion in the upper portion of the upper body half and the upper edge of the double-walled vessel or between the bottom of the double-walled vessel and the bottom of the lower body half or in both these locations, thereby permitting the double-walled vessel to be securely fixed to the outer receptacle so that the idle rotation or skidding of the double-walled vessel caused by the operation of the agitator is positively prevented during use of the device to facilitate the preparation of frozen confections.

The present invention will be further described below by way of example, with reference to the accompanying drawings, of which Figures 14 to 16 have already been described, and in which:

*Figure 1* is a general view partly in cross-section showing one embodiment of a device for preparing frozen confections constructed in accordance with the present invention;

*Figure 2* is a partially sectioned side view similar to *Figure 1* but showing a modification of the device shown in *Figure 1*;

*Figure 3* is a partially sectioned side view similar to *Figure 1* but showing another embodiment of the device shown in *Figure 1*;

*Figure 4* is a fragmentary exploded perspective view showing the details of the engaging portions of the cover and the upper body half of the device shown in *Figure 3*;

*Figure 5* is a schematic perspective view showing the detailed construction of the double-walled vessel of the device shown in *Figure 3*;

*Figure 6* is a fragmentary exploded perspective view showing a modification to the connecting portions of the upper and lower body halves of the device shown in *Figure 1*;

*Figure 7* is a partially sectioned side view similar to *Figure 1* but showing a further embodiment of the device of the present invention;

*Figures 8 to 13* are fragmentary sectional views showing different embodiments of the arrangement of the friction material shown in *Figure 7*;

*Figure 14* is a general sectional elevation showing an example of the device for preparing frozen confections of the prior art;

*Figure 15* is a fragmentary sectional view showing the detailed construction of the ring of the device shown in *Figure 14*; and

*Figure 16* is a fragmentary exploded perspective view showing the rotation-preventing means provided in the device shown in *Figure 14*.

Referring now to *Figure 1* of the drawings, showing one embodiment of a device for preparing frozen confection, the device comprises a double-walled vessel 1 composed of a cylindrical inner vessel 2 having a closed bottom and made of aluminium alloy, for example, and formed by deep drawing, and a cylindrical outer vessel 3 having a

example, and formed by deep drawing. The inner vessel 2 is reclined in the outer vessel 3 to form a space 4 therebetween, with the upper edges of the inner and outer vessels 2, 3 being hermetically sealed together by being rolled or curled together at 2a. Before the upper edges of the inner and outer vessels 2, 3 are sealingly rolled together at 2a, an anodized film or layer is formed on the entire surfaces of the vessels 2, 3 after the deep drawing process and an appropriate amount of a cold-keeping agent 5 is sealingly filled in the space 4. The cold-keeping agent 5 comprises water or carbonated water as a base, for example, to which required amounts of organic or inorganic substances, such as alcohol and sodium chloride, and an organic viscosity increasing agent for obtaining required viscosity are added, respectively, and the melting point of the cold-keeping agent 5 is adjusted in the range from  $-7$  degrees C to  $-17$  degrees C.

The double-walled vessel 1 is received in a cylindrical outer receptacle 6 having a closed bottom and made of a material, such as a synthetic resin.

An appropriate number of recesses or notches 3a (Figure 5) appropriately formed in the outer bottom edge portion of the outer vessel 3 of the double-walled vessel 1 are engaged with corresponding projections 6a formed in the inner bottom edge portion of the outer receptacle 6, so that the relative displacement in the peripheral direction between the double-walled vessel 1 and the outer receptacle 6 is positively prevented.

The outer receptacle 6 is composed of an upper body half 6b and a lower body half 6c threadedly connected to each other as shown in *Figure 1*. In assembling the outer receptacle 6, the double-walled vessel 1 is first placed in the lower body half 6c with the recesses 3a snugly engaged with the projections 6a and then the upper body half 6b is threadedly connected to the lower body half 6c.

Alternatively, the outer receptacle 6 may be made in the form of a single integrally formed receptacle 7 as shown in *Figure 2*. In this case, the receptacle 7 is provided with an upper opening whose diameter is sufficiently large to permit the double-walled vessel 1 to be inserted therethrough into the receptacle 7.

As shown in *Figure 4*, an annular flange 8 is formed in the upper edge of the outer receptacle 6 shown in *Figure 1* and extends radially inwardly from the inner surface of the upper edge portion thereof, and a cover 9 made of a transparent synthetic resin is detachably engaged with the flange 8. In this case, an appropriate number of arresting projections 10, at an appropriate distance from each other, are formed about the outer peripheral surface of a cylindrical flange 11 which extends downwardly from the edge portion of the cover 9, while corresponding notches 12 are formed in the flange 8 so as to receive the projections 10, thereby preventing the cover 9 from being rotated with respect to the cover 9.

Further, as shown in *Figure 1*, a bearing 13 is provided at the centre of the cover 9 for rotatably supporting a rotary shaft 14 of an agitator 15. Further, a recess or depression 16 is formed at the centre of the inner surface of the bottom of the inner

vessel 2 of the double-walled vessel 1 for rotatably receiving the lower end of the rotary shaft 14 of the agitator 15.

The rotary shaft 14 of the agitator 15 has at the upper portion thereof a large-diameter portion 17 in which a reception hole 18 of non-circular cross-section, such as a square cross-section, is formed and a small-diameter portion 19 extending downwardly from the lower end of the large-diameter portion 17. The lower end of the portion 19 is rotatably received in the recess 16 of the bottom of the inner vessel 2. A pair of agitating blades 20 are secure to the small-diameter portion 19 and extend therefrom radially outwardly in opposite directions to each other at positions offset from each other upwardly and downwardly in the inner vessel 2. The outer edges of the blades 20 slidably contact the inner surface of the inner vessel 2. A handle 21 has an engaging shaft 22 extending downwardly from one end thereof and a manipulating knob 23 at the upper surface of the opposite end thereof. The engaging shaft 22 has a cross-section complementary to that of the reception hole 18 of the large-diameter portion 17 of the rotary shaft 14 and it is detachably engaged in the hole 18 so as to permit the rotary shaft 14 and, hence, the agitating blades 20 to be rotated by manually rotating the handle 21. The agitating blades 20 are secured to the small-diameter portion 19 of the rotary shaft 14 at an angle skew of about 10 to 20 degrees with respect to the axis of the rotary shaft 14 and parallel to each other so that the ingredients for preparing frozen confection introduced into the inner vessel 2 can be uniformly agitated by rotating the agitating blades 20. When the agitator 15 is not used, the engaging shaft 22 can be detached from the hole 18 so that the handle 21 is removed from the rotary shaft 14 thereby permitting the device as a whole to be used as an ice pail.

In Figure 3 showing a modified form of the device of Figure 1, the upper body half 6b and the lower body half 6c of the outer receptacle 6 is shown as being threadedly connected to each other in like manner as in the case of Figure 1. However, the upper and lower body halves 6b, 6c may be joined together by pin-inclined groove engaging means as shown in Figure 6, wherein pins 24 are provided along the outer periphery of the lower edge portion of the upper body half 6b at an appropriate distance spaced from each other, for example, and corresponding inclined grooves 25 are formed along the inner periphery of the upper edge of the lower body half 6c with upper ends thereof being opened so as to slidably receive the pins 24 therein for connecting the upper body half 6b to the lower body half 6c.

In Figure 3, the outer cylindrical surface of the outer vessel 3 of the double-walled vessel 1 is formed with at least one elongated vertical recess 26 extending from the lower end of the cylindrical outer surface of the outer vessel 3 upwardly to a position at least higher than the upper edge of the lower body half 6c, while at least one corresponding inwardly extending projection 27 is formed in the inner surface of the lower body half 6c and is adapted to be slidably received in the recess 26 when the

double-walled vessel 1 is inserted in the lower body half 6c, thereby positively preventing relative rotation of the double-walled vessel 1 with respect to the outer receptacle 6 when assembled.

In use of the device as described above, the double-walled vessel 1 is pre-cooled in a refrigerator for several hours to freeze the cold-keeping agent in the space 4 formed between the outer vessel 3 and the inner vessel 2 of the double-walled vessel 1. Then, the double-walled vessel 1 is placed in the lower body half 6c and an appropriate amount of the ingredients for the preparation of frozen confection is placed in the inner vessel 2 of the double-walled vessel 1. Thereafter, the upper body half 6b of the outer receptacle 6 is joined to the lower body half 6c and the cover 9 having the rotary shaft 14 engaged therein is attached to the upper edge of the outer receptacle 6 with the agitating blades 20 located in the inner vessel 2 so that the outer edges of the blades slidably contact with the inner surface of the inner vessel.

When the handle 21 of the agitator 15 is manually rotated, the outer edges of the blades 20 scrape off the frozen material sticking to the inner surface of the inner vessel 2 while the material is appropriately mixed as a whole by the blades 20. After several minutes, frozen confection, such as ice cream or sherbet, can be made.

As described above, since the rotation-preventing means is arranged between the double-walled vessel 1 and the outer receptacle 6, the double-walled vessel 1 is positively prevented from being rotated with respect to the outer receptacle 6 by the frictional force caused by the agitating blades 20 rotated in the double-walled vessel 1 during use of the device by the manual rotation of the handle 21, the use of the device is greatly facilitated.

In the above description, the agitating blades 20 are shown as being rotated manually by the handle 21. It is, however, apparent that they may be rotated by driving means, such as an electric motor.

Figure 7 shows another embodiment of the device of the present invention. The device shown in Figure 7 is similar in construction to that shown in Figure 1 except that an annular friction material 26 having a C-shaped cross-section is applied around the sealingly curled portion 2a at the upper edge of the double-walled vessel 1 and that the inside vertical dimension between the lower surface of the flange 8 at the upper edge of the upper body half 6b and the inner surface at the corner 6d of the bottom edge of the lower body half 6c is so chosen that the friction material 26a is appropriately compressed to generate a frictional resistance between the outer receptacle 6 and the double-walled vessel 1 serving to prevent the relative rotation therebetween when the upper body half 6b is fixedly connected to the lower body half 6c after the double-walled vessel 1 is placed in the lower body half 6c.

The construction of the connecting portions between the upper body half 6b and the lower body half 6c may be a threaded connecting means or may be that shown in Figure 6.

Figure 8 shows the detailed construction of the friction material 26a of the embodiment of device of

Figure 7.

Figure 9 shows a modified form of the annular friction material 26', the function being the same as the friction material 26a shown in Figure 8. The friction material 26' has an H-shaped cross-section and it is kept in position by a cylindrical flange 8a extending downwardly from the flange 8' and having an annular radially outwardly extending bent lip portion 8b.

Figure 10 shows a modified form of the annular friction material 27 which is secured along the corner of the inner edge of the bottom of the lower body half 6c of the outer receptacle 6 as shown instead of being arranged at the upper body half 6b, the function being the same as that of the friction material 26a, 26', in that the frictional resistance is generated, preventing the relative rotation between the double-walled vessel 1 and the outer receptacle 6 when the upper body half 6b is connected to the lower body half 6c after the double-walled vessel 1 is placed in the lower body half 6c.

Figures 11 and 12 show a modified form of a plurality of friction materials 28 secured to the inner surface of the bottom of the lower body half 6c spaced an appropriate distance from each other along the periphery of the bottom, the function being the same as that of the friction material 27 shown in Figure 10.

Figure 13 shows a modified form of the friction materials 28 which are secured to the lower outer surface of the bottom of the double-walled vessel 1 instead of being secured to the bottom of the lower body half 6c, the function being the same as that shown in Figures 11 and 12.

As described above, the devices shown in Figures 7 to 13 can positively prevent relative rotation between the outer receptacle 6 and the double-walled vessel 1 during use of the device in like manner as described in connection with Figures 1 to 6 by virtue of the provision of friction material(s).

The double-walled vessel 1 is shown in the drawings as having the space 4 filled only with cold-keeping agent 5. However, a corrugated annular rib made of material of high heat transmitting property may be arranged in the space 4 and may be secured by other means to either one or both of the walls of the inner and outer vessels 2,3, as shown in Figure 3 of U.K. patent specification No.2144208A. Such a rib can expedite the completion of frozen confections in about 15 minutes, whereas it takes about 30 minutes when a double-walled vessel 1 without such a rib is used.

#### CLAIMS

1. A device for preparing frozen confections comprising a double-walled vessel comprised of a substantially cylindrical inner vessel having a closed bottom and substantially cylindrical outer vessel having a closed bottom and enclosing said inner vessel with the upper edges of the inner and outer vessels being hermetically sealed to one another and with a space being formed between said inner vessel and said outer vessel and a cold-keeping agent sealingly enclosed in said space, a substantially

cylindrical outer receptacle having a closed bottom and adapted to receive said double-walled vessel therein, a cover detachably mounted on the upper edge of the double-walled vessel, and an agitator having a rotary shaft passing through the centre of the cover so as to extend from the exterior of said cover into the interior of said inner vessel with agitating blades being mounted on said rotary shaft in the interior of said inner vessel, means being attached or coupled to said rotary shaft at the exterior of said cover for rotating the agitator, rotation preventing means being provided between said double-walled vessel and said outer receptacle for positively preventing rotation of the agitator from causing said double-walled vessel to be rotated during use of said device.

2. A device according to claim 1, wherein said rotation preventing means comprises concave-convex interengaging means between the inner surface of the outer receptacle and the outer surface of the double-walled vessel.

3. A device according to claim 1, wherein said outer receptacle comprises an upper body half and a lower body half separably connected to each other by connecting means; and said rotation preventing means comprising friction material interposed either between an inwardly extending shoulder portion formed in said upper portion of said upper body half and the upper edge of said double-walled vessel or between the bottom of said double-walled vessel and the bottom of said lower body half or at both these locations.

4. A device according to claim 3, wherein said connecting means comprises male and female thread means on said upper body half and on said lower body half.

5. A device according to claim 3, wherein said connecting means comprises pin-inclined groove engaging means formed of a plurality of pins on said upper or lower body half and corresponding number of inclined grooves formed in the other of said upper and lower body halves.

6. A device according to claim 1 or 2, wherein said outer receptacle is comprised of upper and lower body halves separably connected to each other by male and female screw thread means formed in said upper body half and said lower body half.

7. A device according to claim 1, wherein said outer receptacle is comprised of upper and lower body halves separably connected to each other by pin-inclined groove engaging means formed of a plurality of pins formed on upper or lower body half and a corresponding number of inclined grooves formed in the other of said upper and lower body halves.

8. A device according to claim 2, wherein said rotation preventing means comprises projections formed at the inner bottom edge corner of said outer receptacle and mating recesses formed at the outer bottom edge corner of said double-walled vessel.

9. A device according to any preceding claim, wherein said means for rotating the agitator comprises a handle attached to the rotary shaft.

10. A device according to claim 9, wherein said

handle is detachably mounted on said rotary shaft.

11. A device for preparing frozen confections, constructed and adapted to be used substantially as herein described with reference to and as illustrated in the accompanying drawings.

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